

10/522513

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
5 February 2004 (05.02.2004)

PCT

(10) International Publication Number
WO 2004/011651 A1

(51) International Patent Classification⁷: **C12N 15/50**,
C07K 14/165, G01N 33/50, C12Q 1/68, C12N 7/00

(74) Agent: MILES, John, S.; Eric Potter Clarkson, Park View
House, 58 The Ropewalk, Nottingham NG1 5DD, United
Kingdom (GB).

(21) International Application Number:
PCT/GB2003/002832

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 1 July 2003 (01.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0217434.0 27 July 2002 (27.07.2002) GB

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): THE
ROYAL VETERINARY COLLEGE [GB/GB]; Univer-
sity of London, Royal College Street, London NW1 0TU
(GB).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): BROWNLIE,
John [GB/GB]; Royal veterinary college, Hawkshead
Lane, North Mymms, Hartfield, Herts AL9 7TA (GB).
CHALKER, Victoria, Jane [GB/GB]; Royal veterinary
college, Hawkshead Lane, North Mymms, Hartfield, Herts
AL9 7TA (GB). ERLES, Kerstin [DE/GB]; Royal veteri-
nary college, Hawkshead Lane, North Mymms, Hartfield,
Herts AL9 7TA (GB).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: CANINE RESPIRATORY CORONAVIRUS (CRCV) SPIKE PROTEIN, POLYMERASE AND HEMAGGLU-
TININ/ESTERASE

```
ctcagatgaa tttgaaatat gctattagt ctaagaatag agccccgact gttgctgggtg 60
tttccatact tagtactatg actggcagaa tgtttcatca aaaatgtttg aaaagtatag 120
cagctacacg tgggtgttcct gttgttatag gcaccactaa attttatggc ggctgggatg 180
atatgttacg tcgccttatt aaagatgttg acaatcctgt acctatgggt tgggattatc 240
ctaagtgtga 250
```

(57) Abstract: A canine respiratory coronavirus (CRCV) that is present in the respiratory tract of dogs with canine infectious res-
piratory disease and which has a low level of homology to the enteric canine coronavirus, but which has a high level of homology
to all bovine coronavirus strains (eg Quebec and LY138) and human coronavirus strain OC43. The CRCV spike, polymerase and
hemagglutinin/esterase cDNA and protein partial sequences are listed in Figures (1) to (4), (13) and (14).

WO 2004/011651 A1

INTERNATIONAL SEARCH REPORT

Internal Application No
PCT/00 03/02832

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C12N15/50 C07K14/165 G01N33/50 C12Q1/68 C12N7/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 C07K C12N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the International search (name of data base and, where practical, search terms used) EPO-Internal, BIOSIS, Sequence Search, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	STEPHENSEN, C.B., CASEBOLT, D.B., GANGOPADHYAY, N.N.,: "Phylogenetic analysis of a highly conserved region of the polymerase gene from 11 coronaviruses and development of a consensus polymerase chain reaction assay" VIRUS RESEARCH, AMSTERDAM, NL, vol. 60, no. 2, April 1999 (1999-04), pages 181-189, XP002242737 ISSN: 0168-1702 cited in the application the whole document ----- -/--	1-10, 24, 30, 31
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family		
Date of the actual completion of the international search 20 October 2003		Date of mailing of the international search report 27/10/2003
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 661 epo nl, Fax: (+31-70) 340-3016		Authorized officer Chambonnet, F.

INTERNATIONAL SEARCH REPORT

Internal Application No
PCT/GB 03/02832

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"STUDIES OF RESPIRATORY DISEASE IN RANDOM SOURCE LABORATORY DOGS VIRAL INFECTIONS IN UNCONDITIONED DOGS" BINN L N---; ALFORD J P; MARCHWICKI R H; KEEFE T J; BEATTIE R J; WALL H G, vol. 29, no. 1, 1979, pages 48-52, XP0008023128 cited in the application the whole document	
A	WO 93 23423 A (SMITHKLINE BEECHAM CORP ; JONES ELAINE V (US); KLEPFER SHARON (US); MI) 25 November 1993 (1993-11-25) the whole document	1-87
X	US 5 672 350 A (BABIUK LORNE A ET AL) 30 September 1997 (1997-09-30) the whole document	47-54
A	WO 99 25838 A (CONTRERAS ANAPATRICIA ; BROWN THOMAS P (US); UNIV GEORGIA (US); VILLEG) 27 May 1999 (1999-05-27) claims 8-12	1
A	US 6 057 436 A (KLEPFER SHARON ET AL) 2 May 2000 (2000-05-02) the whole document	1
A	EP 0 510 773 A (AKZO NV) 28 October 1992 (1992-10-28) the whole document	1
X	US 5 916 570 A (KAPIL SANJAY) 29 June 1999 (1999-06-29) the whole document	47-54
A	HASOKSUZ M ET AL: "ANTIGENIC VARIATION AMONG BOVINE ENTERIC CORONAVIRUSES (BECV) AND BOVINE RESPIRATORY CORONAVIRUSES (BRCV) DETECTED USING MONOCLONAL ANTIBODIES" ARCHIVES OF VIROLOGY, NEW YORK, NY, US, vol. 144, no. 12, 1999, pages 2441-2447, XP001005398 ISSN: 0304-8608 the whole document	18-46
P,X	ERLES KERSTIN ET AL: "Detection of a group 2 coronavirus in dogs with canine infectious respiratory disease." VIROLOGY, vol. 310, no. 2, 5 June 2003 (2003-06-05), pages 216-223, XP002257085 ISSN: 0042-6822 the whole document	1-7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/02832

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Although claims 66 to 69 and 79 to 82 are directed to a method of treatment of the animal body, the search could be carried out and based on the alleged effects of the compound/composition.

Although claims 24 to 36, claims 67 to 69 and 87 are directed to a diagnostic method comprising steps practised on the animal body, the search has been carried out and based on the alleged effects of the compound/composition.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internal Application No
PCT/GB 03/02832

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9323423	A	25-11-1993	AT 225805 T AU 670092 B2 AU 4251593 A CA 2135200 A1 DE 69332375 D1 DE 69332375 T2 DK 640098 T3 EP 0640098 A1 ES 2182827 T3 JP 3245169 B2 JP 7508421 T PT 640098 T WO 9323423 A1 US 6057436 A US 6372224 B1 US 2002127245 A1	15-10-2002 04-07-1996 13-12-1993 25-11-1993 14-11-2002 13-02-2003 28-10-2002 01-03-1995 16-03-2003 07-01-2002 21-09-1995 31-01-2003 25-11-1993 02-05-2000 16-04-2002 12-09-2002
US 5672350	A	30-09-1997	CA 2065365 A1 WO 9102752 A1 DE 69013512 D1 DE 69013512 T2 EP 0489033 A1 US 5369026 A	23-02-1991 07-03-1991 24-11-1994 23-02-1995 10-06-1992 29-11-1994
WO 9925838	A	27-05-1999	AU 1408499 A WO 9925838 A1	07-06-1999 27-05-1999
US 6057436	A	02-05-2000	US 2002127245 A1 AT 225805 T AU 670092 B2 AU 4251593 A CA 2135200 A1 DE 69332375 D1 DE 69332375 T2 DK 640098 T3 EP 0640098 A1 ES 2182827 T3 JP 3245169 B2 JP 7508421 T PT 640098 T WO 9323423 A1 US 6372224 B1 AU 666298 B2 AU 9128691 A CA 2096010 A1 EP 0557455 A1 IE 913948 A1 JP 6502768 T JP 2003093078 A KR 204258 B1 NZ 240558 A WO 9208487 A1 US 6280974 B1 US 2002115064 A1 ZA 9108988 A	12-09-2002 15-10-2002 04-07-1996 13-12-1993 25-11-1993 14-11-2002 13-02-2003 28-10-2002 01-03-1995 16-03-2003 07-01-2002 21-09-1995 31-01-2003 25-11-1993 16-04-2002 08-02-1996 11-06-1992 17-05-1992 01-09-1993 20-05-1992 31-03-1994 02-04-2003 15-06-1999 25-11-1994 29-05-1992 28-08-2001 22-08-2002 30-12-1992
EP 0510773	A	28-10-1992	AU 645417 B2 AU 1513192 A	13-01-1994 29-10-1992

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interns Application No
PCT/GB 03/02832

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0510773 A		CA 2066940 A1	26-10-1992
		EP 0510773 A1	28-10-1992
		JP 3420258 B2	23-06-2003
		JP 5260976 A	12-10-1993
		NZ 242471 A	26-05-1993
		US 5661006 A	26-08-1997
US 5916570 A	29-06-1999	AU 705186 B2	20-05-1999
		AU 6383296 A	09-01-1997
		CA 2224309 A1	27-12-1996
		EP 0833903 A1	08-04-1998
		WO 9641874 A1	27-12-1996

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL SEARCHING AUTHORITY

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

To:

ERIC POTTER & CLARKSON
Attn. Miles, John S.
Park View House
58 The Ropewalk
Nottingham NG1 5DD
UNITED KINGDOM

RECORDS	CHECKED
27 OCT 2003	
PARTNER	ACTIONED

Date of mailing
(day/month/year)

27/10/2003

Applicant's or agent's file reference

RVCW/P28428PC

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/GB 03/02832

International filing date
(day/month/year)

01/07/2003

Applicant

ROYAL VETERINARY COLLEGE

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Geertruida Groeneveld-Van der Spek

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference RVCW/P28428PC	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 03/02832	International filing date (day/month/year) 01/07/2003	(Earliest) Priority Date (day/month/year) 27/07/2002
Applicant ROYAL VETERINARY COLLEGE		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☒ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

CANINE RESPIRATORY CORONAVIRUS (CRCV) SPIKE PROTEIN, POLYMERASE
AND HEMAGGLUTININ/ESTERASE

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

Continuation of Box I.1

Although claims 66 to 69 and 79 to 82 are directed to a method of treatment of the animal body, the search could be carried out and based on the alleged effects of the compound/composition.

Although claims 24 to 36, claims 67 to 69 and 87 are directed to a diagnostic method comprising steps practised on the animal body, the search has been carried out and based on the alleged effects of the compound/composition.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/03/02832

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9323423	A	25-11-1993	AT 225805 T	15-10-2002
			AU 670092 B2	04-07-1996
			AU 4251593 A	13-12-1993
			CA 2135200 A1	25-11-1993
			DE 69332375 D1	14-11-2002
			DE 69332375 T2	13-02-2003
			DK 640098 T3	28-10-2002
			EP 0640098 A1	01-03-1995
			ES 2182827 T3	16-03-2003
			JP 3245169 B2	07-01-2002
			JP 7508421 T	21-09-1995
			PT 640098 T	31-01-2003
			WO 9323423 A1	25-11-1993
			US 6057436 A	02-05-2000
			US 6372224 B1	16-04-2002
			US 2002127245 A1	12-09-2002
US 5672350	A	30-09-1997	CA 2065365 A1	23-02-1991
			WO 9102752 A1	07-03-1991
			DE 69013512 D1	24-11-1994
			DE 69013512 T2	23-02-1995
			EP 0489033 A1	10-06-1992
US 5369026 A			US 5369026 A	29-11-1994
WO 9925838	A	27-05-1999	AU 1408499 A	07-06-1999
			WO 9925838 A1	27-05-1999
US 6057436	A	02-05-2000	US 2002127245 A1	12-09-2002
			AT 225805 T	15-10-2002
			AU 670092 B2	04-07-1996
			AU 4251593 A	13-12-1993
			CA 2135200 A1	25-11-1993
			DE 69332375 D1	14-11-2002
			DE 69332375 T2	13-02-2003
			DK 640098 T3	28-10-2002
			EP 0640098 A1	01-03-1995
			ES 2182827 T3	16-03-2003
			JP 3245169 B2	07-01-2002
			JP 7508421 T	21-09-1995
			PT 640098 T	31-01-2003
			WO 9323423 A1	25-11-1993
			US 6372224 B1	16-04-2002
			AU 666298 B2	08-02-1996
			AU 9128691 A	11-06-1992
			CA 2096010 A1	17-05-1992
			EP 0557455 A1	01-09-1993
			IE 913948 A1	20-05-1992
			JP 6502768 T	31-03-1994
			JP 2003093078 A	02-04-2003
			KR 204258 B1	15-06-1999
			NZ 240558 A	25-11-1994
			WO 9208487 A1	29-05-1992
			US 6280974 B1	28-08-2001
			US 2002115064 A1	22-08-2002
			ZA 9108988 A	30-12-1992
EP 0510773	A	28-10-1992	AU 645417 B2	13-01-1994
			AU 1513192 A	29-10-1992

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"STUDIES OF RESPIRATORY DISEASE IN RANDOM SOURCE LABORATORY DOGS VIRAL INFECTIONS IN UNCONDITIONED DOGS" BINN L N---; ALFORD J P; MARCHWICKI R H; KEEFE T J; BEATTIE R J; WALL H G, vol. 29, no. 1, 1979, pages 48-52, XP0008023128 cited in the application the whole document	
A	WO 93 23423 A (SMITHKLINE BEECHAM CORP ; JONES ELAINE V (US); KLEPFER SHARON (US); MI) 25 November 1993 (1993-11-25) the whole document	1-87
X	US 5 672 350 A (BABIUK LORNE A ET AL) 30 September 1997 (1997-09-30) the whole document	47-54
A	WO 99 25838 A (CONTRERAS ANAPATRICIA ; BROWN THOMAS P (US); UNIV GEORGIA (US); VILLEG) 27 May 1999 (1999-05-27) claims 8-12	1
A	US 6 057 436 A (KLEPFER SHARON ET AL) 2 May 2000 (2000-05-02) the whole document	1
A	EP 0 510 773 A (AKZO NV) 28 October 1992 (1992-10-28) the whole document	1
X	US 5 916 570 A (KAPIL SANJAY) 29 June 1999 (1999-06-29) the whole document	47-54
A	HASOKSUZ M ET AL: "ANTIGENIC VARIATION AMONG BOVINE ENTERIC CORONAVIRUSES (BECV) AND BOVINE RESPIRATORY CORONAVIRUSES (BRCV) DETECTED USING MONOCLONAL ANTIBODIES" ARCHIVES OF VIROLOGY, NEW YORK, NY, US, vol. 144, no. 12, 1999, pages 2441-2447, XP001005398 ISSN: 0304-8608 the whole document	18-46
P, X	ERLES KERSTIN ET AL: "Detection of a group 2 coronavirus in dogs with canine infectious respiratory disease." VIROLOGY, vol. 310, no. 2, 5 June 2003 (2003-06-05), pages 216-223, XP002257085 ISSN: 0042-6822 the whole document	1-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/03/02832

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0510773	A	CA 2066940 A1	26-10-1992
		EP 0510773 A1	28-10-1992
		JP 3420258 B2	23-06-2003
		JP 5260976 A	12-10-1993
		NZ 242471 A	26-05-1993
		US 5661006 A	26-08-1997
<hr/>			
US 5916570	A	AU 705186 B2	20-05-1999
	29-06-1999	AU 6383296 A	09-01-1997
		CA 2224309 A1	27-12-1996
		EP 0833903 A1	08-04-1998
		WO 9641874 A1	27-12-1996
<hr/>			

INTERNATIONAL SEARCH REPORT

International Application No

PCT/03/02832

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/50 C07K14/165 G01N33/50 C12Q1/68 C12N7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, Sequence Search, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>STEPHENSEN, C.B., CASEBOLT, D.B., GANGOPADHYAY, N.N.: "Phylogenetic analysis of a highly conserved region of the polymerase gene from 11 coronaviruses and development of a consensus polymerase chain reaction assay" VIRUS RESEARCH, AMSTERDAM, NL, vol. 60, no. 2, April 1999 (1999-04), pages 181-189, XP002242737 ISSN: 0168-1702 cited in the application the whole document</p> <p style="text-align: center;">----- -/--</p>	1-10, 24, 30, 31



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

20 October 2003

Date of mailing of the international search report

27/10/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Chambonnet, F.